

Claims

1. A method of reducing paging-related delays comprising:
determining by a mobile station (MS) that at least one condition from
5 the group consisting of a low mobility condition and an active user messaging
condition is present for the MS; and
transitioning, as triggered by the presence of the at least one condition,
to at least one operational mode in which paging-related delays for the MS
are reduced.
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2. The method of claim 1, wherein the low mobility condition is present for
the MS when the MS has not performed idle handoff out of a zone designated
by certain number of pilots for a certain period of time.
- 15 3. The method of claim 1, wherein the low mobility condition is present for
the MS when an idle handoff rate of the MS is less than or equal to an idle
handoff rate threshold.
4. The method of claim 3, further comprising receiving the idle handoff
20 rate threshold from a radio access network (RAN).
5. The method of claim 4, wherein the idle handoff rate threshold
indicates a loading level of a serving site access channel.
- 25 6. The method of claim 4, wherein receiving the idle handoff rate
threshold from the RAN comprises receiving the idle handoff rate threshold
via an overhead message on a paging/broadcast channel.
7. The method of claim 4, wherein receiving the idle handoff rate
30 threshold from the RAN comprises receiving the idle handoff rate threshold
via a traffic channel.

8. The method of claim 1, wherein the active user messaging condition is present when the MS has recently been involved in sending or receiving user messaging.

5 9. The method of claim 8, wherein user messaging comprises messaging from the group consisting of data burst messaging, short message service (SMS) messaging, short data burst (SDB) messaging, voice mail notification messaging, email notification messaging, and broadcast programming request messaging.

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10. The method of claim 1, wherein the active user messaging condition is present when the MS becomes newly available to a group of associated communication devices, wherein each of the group of associated communication devices is related to the MS as a messaging buddy.

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11. The method of claim 10, wherein the MS becomes newly available by performing at least one action from the group consisting of powering up, completing a call, and changing a presence state of the MS.

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12. The method of claim 10, wherein the MS becomes newly available by sending a presence update to a radio access network (RAN) indicating that the MS is no longer in an offline presence state.

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13. The method of claim 10, wherein the group of associated communication devices includes a threshold number of members.

14. The method of claim 10, wherein the group of associated communication devices includes a threshold number of available members.

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15. The method of claim 10, wherein the group of associated communication devices includes a threshold percentage of available members.

16. The method of claim 1, wherein the active user messaging condition is present after the MS receives a recent read notification for messaging associated with the MS, wherein the read notification indicates that another user has accessed the messaging associated with the MS.

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17. The method of claim 16, wherein the messaging associated with the MS comprises messaging from the group consisting of data burst messaging (DBM), short data burst (SDB) messaging, short message service (SMS) messaging, voice mail messaging, e-mail messaging, presence messaging, and Caller ID messaging.

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18. The method of claim 1, further comprising:
when remaining battery life for the MS falls below a power saving threshold, exiting the at least one operational mode in which paging-related delays for the MS are reduced.

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19. The method of claim 18, wherein the MS exits semi-dormant mode by sending a report with an indicator that the report is a last report.

20. The method of claim 1, wherein the at least one operational mode comprises MS modes from the group consisting of a semi-dormant mode, an unslotted mode, and a reduced slot cycle index (RSCI) mode, wherein the MS performs periodic location updates in the semi-dormant mode.

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21. The method of claim 1, wherein transitioning comprises transitioning to a semi-dormant mode only when the low mobility condition is present for the MS, wherein the MS performs periodic location updates in the semi-dormant mode.

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22. The method of claim 1, wherein transitioning comprises transitioning to a semi-dormant mode only when both the low mobility condition and the active user messaging condition is present for the MS, wherein the MS performs periodic location updates in the semi-dormant mode.

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23. The method of claim 1, wherein transitioning comprises only transitioning to a reduced slot cycle index (RSCI) mode when the active user messaging condition is present for the MS.

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24. The method of claim 1, wherein transitioning comprises:
requesting approval for an operational mode change from a radio access network (RAN); and
receiving an indication that the RAN approves the operational mode
10 change.

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25. The method of claim 24, wherein receiving the indication that the RAN approves comprises receiving an indication that the RAN approves of a mode change to a semi-dormant mode for a particular period of time, wherein the
15 MS performs periodic location updates in the semi-dormant mode.

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26. The method of claim 24, wherein receiving the indication that the RAN approves comprises receiving an indication that the RAN approves of a mode change to a semi-dormant mode for a maximum number of reports, wherein
20 the MS performs periodic location updates in the semi-dormant mode.

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27. The method of claim 24, wherein receiving the indication that the RAN approves comprises receiving an indication that the RAN approves of a mode change to a reduced slot cycle index (RSCI) mode for a particular period of
25 time.

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28. The method of claim 1, wherein transitioning comprises only transitioning as triggered by the presence of the at least one condition and further by an indication that a serving cell of the MS has sufficient unused
30 capacity.

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29. The method of claim 28, further comprising receiving, from a radio access network (RAN), a broadcast indication of unused capacity for the serving cell.

5 30. The method of claim 29, wherein the broadcast indication is communicated using a message from the group of messages consisting of an access parameters message and a broadcast short message service (SMS) message.

10 31. The method of claim 1, wherein transitioning comprises only transitioning as triggered by the presence of the at least one condition and further when the MS has sufficient battery life remaining.

32. A mobile station (MS) comprising:

a transmitter;

a receiver; and

a processor, coupled to the transmitter and the receiver,

5 adapted to determine that at least one condition from the group consisting of a low mobility condition and an active user messaging condition is present for the MS; and

10 adapted to transition, as triggered by the presence of the at least one condition, to at least one operational mode in which paging-related delays for the MS are reduced.

33. The MS of claim 32, wherein the at least one operational mode comprises MS modes from the group consisting of a semi-dormant mode, an unslotted mode, and a reduced slot cycle index (RSCI) mode, wherein the MS
15 performs periodic location updates in the semi-dormant mode.

34. The MS of claim 32, wherein the low mobility condition is present for the MS when an idle handoff rate of the MS is less than or equal to an idle handoff rate threshold.
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35. The MS of claim 32, wherein the active user messaging condition is present when the MS has recently been involved in sending or receiving user messaging.

25 36. The MS of claim 32, wherein the active user messaging condition is present when the MS becomes newly available to a group of associated communication devices, wherein each of the group of associated communication devices is related to the MS as a messaging buddy.

30 37. The MS of claim 32, wherein the active user messaging condition is present after the MS receives, via the receiver, a recent read notification for messaging associated with the MS, wherein the read notification indicates that another user has accessed the messaging associated with the MS.

38. The MS of claim 32, wherein the processor is further adapted to exit,
the at least one operational mode in which paging-related delays for the MS
are reduced, when remaining battery life for the MS falls below a power
5 saving threshold.

39. The MS of claim 32, wherein transitioning comprises:
requesting, via the transmitter, approval for an operational mode
change from a radio access network (RAN); and
10 receiving, via the receiver, an indication that the RAN approves the
operational mode change.